

Claims:

1. A centrifugal pump, in particular for blood in cardiac substitution or assist devices, having a pump rotor, located without bearings and rotatably inside a housing (11) that is closed in fluid- and gas-tight fashion except for at least one inlet opening and at least one outlet opening (12, 13), which pump rotor is simultaneously the rotor of a drive motor and has one or more permanently magnetized regions distributed uniformly over its circumference, and outside the housing, above and below the rotor (14), there is one stator (18, 19) each of the drive motor, so that the stators (18, 19), in the gap between them and the permanently magnetized region or regions of the rotor (14), generate a rotating magnetic flux, characterized in that the rotor (14) is embodied symmetrically to its center plane and has an upper and a lower covering (16, 17, 16', 17'); and that the rotor (14) and/or the pump housing (11) are shaped such that the axial spacings between the upper and lower covering (16, 17, 16', 17') and the upper and lower housing wall in the radially inner region of the rotor (14) less than in the radially outer region in such a way that in the radially inner region of the rotor (14), the rotor side chambers (26, 26', 27, 27') each have one throttle gap (116, 117), which in operation affect the radially inward-oriented back flows in the rotor side chambers (26, 26', 27, 27') such that upon an axial deflection of the rotor (14), different pressure distributions occur above and below the rotor (14), as a result of which forces acting on the predominant surface area of the coverings (16, 16', 17, 17') are generated which effect an axial stabilization of the rotor (14) and are operative in the same way against tilting of the rotor (14) in the housing (11).

2. The centrifugal pump as recited in claim 1, characterized in that the spacings between the upper and lower rotor covering (16, 17, 16', 17') and the top and bottom sides of the housing decrease continuously radially inward.

3. The centrifugal pump as recited in claim 1, characterized in that in the radially inner region of the rotor (14), annular constrictions between the rotor coverings (16, 17) and the upper and lower housing walls are embodied as throttle gaps (116, 117).

4. The centrifugal pump as recited in claim 3, characterized in that the annular constrictions are formed by annular protrusions or beads (132, 133) on the rotor (14) and/or on the housing (11).

5. The centrifugal pump as recited in one of claims 1 through 4, characterized in that the radial centering of the rotor (14) is effected passively by means of reluctance forces.

6. The centrifugal pump as recited in one of claims 1 through 5, characterized in that the rotor (14) is fabricated entirely of paramagnetic and/or ferromagnetic material.

7. The centrifugal pump as recited in one of claims 1 through 6, characterized in that at least its surfaces that are in fluid contact are provided with a coating adapted to the properties of the fluid.

8. The centrifugal pump as recited in one of claims 1 through 7, characterized in that it is a blood pump that is implantable in the body.

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5. The centrifugal pump as recited in one of the foregoing claims, characterized in that it is a blood pump that is implantable in the body.